Highway Safety Flares Threaten Water Quality with Perchlorate

Miguel A. Silva, 7/8/03

Results from a series of laboratory tests conducted by the Santa Clara Valley Water (District) confirm that highway safety flares can be a significant source of perchlorate (ClO_4-) contamination to water, even when flares burn completely. Up to 3,500,000 μg of perchlorate ions leached out of a single standard 20-minute unburned flare in just 3.5 hrs of contact with clean water. Fully burned flares leached up to 1,950 μg of perchlorate ions per flare.

The study found that more than 40 metric tons of flares were used/burned in 2002 alone in Santa Clara County. Theoretically (assuming 100% homogenous full mixture and 0% mass loss), a single unburned 20-minute flare can potentially contaminate up to 2.2 acre-feet of drinking water to just above California Department of Health Services' current Action Level of 4 μg/L.

The pilot tests monitored flare-water mixtures for pH, conductivity, temperature, and dissolved concentrations of perchlorate and nitrate (as NO_3-), including dry weight analysis. This poster provides detailed results of the District's laboratory study.

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